WHAT IS CLAIMED IS:

1. A flexible circuit having a neutral plane and configured to be bent about an imaginary bending axis, said flexible circuit comprising:

at least one dielectric layer;

at least two electrically conductive layers, wherein said electrically conductive layers are separated by dielectric layers; and

a patch on the side of said flexible circuit opposite from the imaginary bending axis, said patch configured so that the neutral plane is located either inside the electrically conductive layer that is remote from the bending axis, or between the outer surface of said electrically conducting layer and the outer surface of said patch.

2. A flexible circuit having a neutral plane and configured to be bent about an imaginary bending axis, said flexible circuit comprising:

at least one dielectric layer;

at least two electrically conductive layers, wherein said electrically conductive layers are separated by dielectric layers; and

a patch on the side of said flexible circuit opposite from the imaginary bending axis, said patch configured so that the neutral plane is located between the outer surface of the patch and about the center of the electrically conductive layer that is remote from the bending axis.

3. The flexible circuit of claim 2, wherein said neutral plane is located between the outer surface of said patch and a location inside the electrically conductive layer that is remote from the bending axis, said location being a distance of about 10% of the thickness of the layer from its outer surface.

4. The flexible circuit of claim 2, wherein said neutral plane is located along the outer surface of the electrically conductive layer that is remote from said bending axis.

5. The flexible circuit of claim 2, wherein at least one of said electrically conductive layers comprises a plurality of circuit traces.

6. The flexible circuit of claim 5, wherein the electrically conductive layer remote from the bending axis comprises a plurality of circuit traces.

7. The flexible circuit of claim 2, wherein said dielectric layer comprises a polyimide.

8. The flexible circuit of claim 2, wherein at least one of said electrically conductive layers comprises copper.

9. The flexible circuit of claim 2, wherein at least one of said electrically conductive layers comprises nickel.

10. A flexible circuit having a neutral plane and configured to be bent about an imaginary bending axis, said flexible circuit comprising:

at least two electrically conductive layers;

at least one dielectric layer separating the electrically conductive layers;

at least one high modulus patch, wherein said patch is configured and located on the side of the flexible circuit that is remote from the bending axis to provide that said conductive layers are subjected to compressive forces during bending of said circuit about said bending axis.

11. A flexible circuit having a neutral plane and configured to be bent about an imaginary bending axis, said flexible circuit comprising:

at least two electrically conductive layers;

at least one dielectric layer separating the electrically conductive layers;

a high modulus patch, wherein said patch is configured such that the location of the neutral plane of the flexible circuit is further from the imaginary bending axis than the location of the neutral plane would be without said patch.

12. The flexible circuit of claim 11, wherein said dielectric layer comprises a polyimide.

13. The flexible circuit of claim 11, wherein one of said electrically conductive layers comprises copper.

14. A method of constructing a flexible circuit having a neutral plane, comprising the steps of:

a. choosing a first estimate of the thickness of the patch;

b. determining the total modulus of the flexible circuit and the patch;

c. determining the total cross sectional area of the flexible circuit and the patch;

d. determining the location of the neutral plane of said flexible circuit and patch combination using the total modulus and the total cross sectional area of the flexible circuit and the patch; and

e. providing the patch with said first estimated thickness when said location of the neutral plane falls within a range of desired locations; or

f. when said location of the neutral plane determined in step d. falls outside the range of desired locations, choosing a second estimate of the thickness of said patch as a function of the distance of said neutral plane from said desired location and repeating steps b., c., d. and e. until the estimated patch thickness provides that the neutral plane is within the range of desired locations.

15. A method for determining the thickness of a patch of given modulus, which is to be attached on one side of a flexible circuit having a neutral plane and a base, the method comprising the steps of:

a. choosing a first estimate of the thickness of the patch;

b. determining the total modulus of the flexible circuit and the patch;

c. determining the total cross sectional area of the flexible circuit and the patch;

d. determining the location of neutral plane of said flexible circuit and patch combination relative to said base using the total modulus and the total cross sectional area of the flexible circuit and the patch; and

e. choosing said estimate as the thickness of said patch when said location of the neutral plane determined in step d. falls within a range of desired locations; or

f. when said location of the neutral plane determined in step d. falls outside the range of desired locations, choosing a second estimate of the thickness of said patch as a function of the distance of said neutral plane from said desired location and repeating steps b., c., d. and e. until the estimated patch thickness provides that the neutral plane is within the range of desired locations.

16. The method of claim 15, wherein:

said range of desired locations has an upper limit relative to said base and a lower limit relative to said base; and

said second estimate is chosen to be greater than said first estimate if the location of said neutral plane relative to said base is below said lower limit, else said second estimate is chosen to be less than said first estimate.

17. The method claim 15, wherein said second estimate is determined according to the Newton-Raphson method.

18. A method for determining the desired thickness of a patch of given modulus, which is to be added to one side of a flexible circuit having a neutral plane and a base, comprising:

a. choosing a first estimate of the thickness of the patch;

b. determining the total modulus M_{Total} of the flexible circuit and the patch using a first predetermined method;

c. determining the total cross sectional area A_{Total} of the flexible circuit and the patch using a second predetermined method;

d. determining the location of the neutral plane of said flexible circuit and patch combination relative to said base using the formula:

$$d = \frac{M_{Total}}{A_{Total}}$$

e. selecting said first estimate as the desired thickness of said patch when said location of the neutral plane determined in step d. relative to said base falls within a range of desired locations; or

f. when said location of the neutral plane determined in step d. falls outside the range of desired locations, choosing a new estimate for the thickness of said patch according to the distance of said location of neutral plane from said desired location and repeating b., c., d. and e. until the estimated patch thickness provides that the neutral plane is within the range of desired locations.

19. A method for determining the thickness of a patch of given modulus, which is to be added to one side of a flexible circuit having a neutral plane and a base and a plurality of layers, comprising:

a. choosing a first estimate of the thickness of the patch;

b. scaling the width of each of said layers by the ratio of the modulus of the layer to a reference modulus;

c. determining the total modulus M_{Total} of the flexible circuit and the patch using a first predetermined method;

d. determining the total cross sectional area A_{Total} of the flexible circuit and the patch using a second predetermined method;

e. determining the location of the neutral plane of said flexible circuit and patch combination relative to said base using the formula:

$$d = \frac{M_{Total}}{A_{Total}}$$

f. selecting said first estimate as the desired thickness of said patch when said location of the neutral plane determined in step e. relative to said base falls within a range of desired locations; or

g. when said location of the neutral plane determined in step e. falls outside the range of desired locations, choosing a new estimate for the thickness of said patch according to the distance of said location of neutral plane from said desired location and repeating b., c., d., e. and f. until the estimated patch thickness provides that the neutral plane is within the range of desired locations.